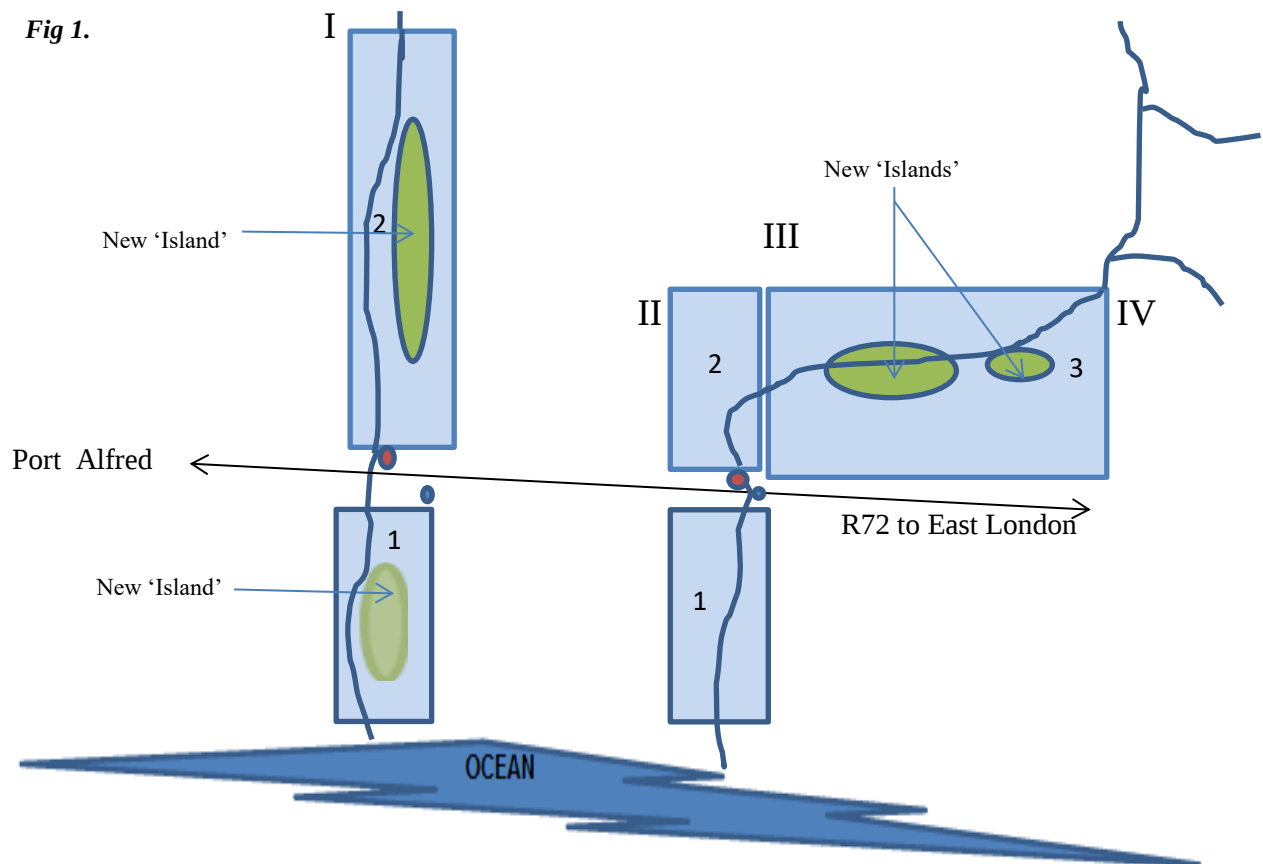


African Spoonbill *Platalea alba* Dispersal at East Kleinemonde estuary.

A Case Study

Fig 1.



C. Engelbrecht

2015

1. Introduction

The purpose of this article is to explore the relationship between fluctuations of estuarine water levels and the African Spoonbill (*Platalea alba*) dispersal between five feeding niches for the period 3/4 to 1/5/2015 in the West and East Kleinemonde estuaries in the Eastern Cape.

This investigation touches on habitat specialization, open water invertebrate feeding and relative site level inundation.

2. Methodology

From the day (3/4) when the estuary broke open and remained open (temporarily open = TO) to 1/5/2015 when it closed again (temporarily closed = TC), daily counts (with the exception of 9 and 10/4) were undertaken between 16h00 and 17h00 from five predetermined positions I - IV (see map). The Riet River and its counting position are not shown on this map. The four vantage points for both

estuaries were on the bridges over the two rivers along the R72 tarred road. They provided suitable height to be able to look north (upstream) and south (downstream) in order to count the birds. In addition, as it turned out, this period formed a convenient 'whole' between the opening and closing days almost a month later. Variables, e.g. the weather and human activity remained surprisingly constant during this period making this a fair investigation. Equipment used was a 10x50 binoculars, a 20-60x90 spotting scope, tripod and monopod. Supporting photos (of which six were included herein) were taken with a DSLR camera and 175-500 mm lens.

3. Areas 1 of West and East Kleinemonde estuaries

No African Spoonbills were present in Areas 1 of the West and East Kleinemonde estuaries during this period. The reason could be that residential housing on both banks of the estuaries is too close to the water's edge. Secondly, other human activities such as paddling, boating, fishing, swimming etc., scare birds. Thirdly, before 3/4 the water level in both estuaries was high and only in exceptional circumstances after 3/4 was the bottom (of the west Kleinemonde estuary Area 1) sufficiently exposed to form a new 'island'.

When the water level dropped in Area 1 of the West Kleinemonde by 16/4 to its lowest level, one would have expected the Spoonbills to visit this potentially ideal feeding niche. However, no Spoonbills were present between 2/4 and the end of the study period. On the other hand, small numbers (<10) of Egrets, Herons and Ibises regularly visited this newly exposed niche. Furthermore, the water regimes of both estuaries north of the bridges further upstream are wake free zones. As a result, boating disturbance for instance, is here less than south of the bridges, making the northern areas more attractive for African Spoonbills and other wading species.

4. Area 2 of the West Kleinemonde estuary

The furthest beacon (I) identified for observation and counting is about 400 m upstream on the left bank of the rivers.

Before the heavy rains (161 mm) during the 18 hours prior to the highest water level and subsequent opening of both estuaries in the early hours of 2/4, there were on average 15 African Spoonbills in this area per day. But, as the water level dropped from 3/4 onwards, the total number of Spoonbills increased on a daily basis until 11/4 to an all-time high of 68. From 12/4 they joined those frequenting East Kleinemonde estuary Area 3. After 14/4 they never returned for the remainder of the study period, and despite the fact that from 3/4, large areas of the estuary were exposed for the rest of the period, they did not visit this niche feeding area. A further variable in this equation is that from 3/4 these exposed areas would over time naturally dry out, making the foraging area less suitable for their feeding strategies.

5. Area 2 of the East Kleinemonde estuary

The furthest beacon (II) identified for observation and counting is about 250 m upstream on the left bank of this estuary.

Although built high on the banks of the river, housing here is not close enough to cause disturbances. In addition, other anthropogenic disturbances were absent during this study period. Prior to 2/4, the water level covered almost all of the surface area making it too deep for Spoonbills to wade.

However, a few individual birds arrived from 3/4 (with the exception of 11 on 8/4 as indicated in Table I) when the water level dropped to nearly its lowest level. Still, this area did not attract any meaningful numbers up to 17/4 (on average < 4 per day). The last few (6) left on this day. As was the case for Area 2 of the West Kleinemonde estuary, no Spoonbills were observed for the rest of the period.

6. Area 3 of the East Kleinemonde estuary

The distance between beacon (III) and the furthest point (IV) is about 300 m to the right on the left bank of the East Kleinemonde estuary, Area 3.

From 3/4 onwards, areas normally covered in water, gradually became exposed – to about <300 mm deep, which is good enough for Spoonbills to forage (photo 2). As the water level dropped further and stabilized from 19/4 onwards, two ‘islands’ were formed but dried out over time (photos 4 and 5). Initially, when the water level was too high Spoonbills foraged on the shallow edges of the water regime but as it gradually shrunk, and providing the shallowness remained conducive, Spoonbills kept following the shrinking water edges (photo 4). Later, when they have exhausted the edges, and providing the middle water regime areas are just about ideally exposed, then they would leave the edges and forage in water levels less than 300 mm deep – that is, the new ‘islands’.

Although feeding niches differed in size but with feeding conditions intact, they seemed to have maximized the situation. Individual birds prodded the sub-water areas up to 49 times per minute and did so for hours on end without taking a break. However, on four occasions (19/4, 20/4, 27/4 and 28/4) the Spoonbills sat practically the entire day on the same spot without exploring their feeding niche and without the flock moving around for more than about 10 m in total (photo 4). Thus: on some days Spoonbills fed less than on other days. This variable – i.e. relationship between active feeding and periods of inactivity – did not receive special attention in this study because it was not practical to observe the birds for such a length of time. It would have required 30 days x 12 hours of uninterrupted observation (or 360 hours). Nevertheless energy used per day against energy taken in per day as measured in kJ needs its own investigation

The total number of Spoonbills for both Areas 2 and 3 of the East Kleinemonde estuary, increased from 40 on 3/4 to 93 on 16/4 – the day of the lowest water level thus far. From the next day the numbers declined. No Spoonbills returned to any of the former feeding niches. The question is: where did the birds that left, go?

7. Comparison of the relative popularity between the five areas counted

Before and immediately after 3/4, study Area 2 of the West Kleinemonde estuary was most popular for 27% of the time (eight of 30 days). This changed the next two days to study Area 3 when the Kleinemonde East estuary became the preferred feeding niche for 73% of the time. To all intents and purposes, the Spoonbills left study Areas 2 of both estuaries at the same time, never to return again.

8. Conclusions

Prior to the heavy rains of 2/4 (when the water levels were high), but thereafter and up to 12/4 (when the water levels were low), Spoonbills mainly frequented West Kleinemonde estuary Area 2 and to a lesser extent Area 3 of East Kleinemonde estuary. The daily average ratio was 2,3:1.

When, after the flood, the water levels dropped to an all-time low on 16/4, the Spoonbills already moved from West Kleinemonde estuary Area 2 on 14/4 to the East Kleinemonde estuary Area 3. The average four birds per day from the East Kleinemonde Area 2 seemed to have **joined** those of the East Kleinemonde estuary Area 3. Afterwards, the East Kleinemonde estuary's Area 3 remained the preferred foraging niche for the rest of the study period. The sheer number of Spoonbills visiting the respective estuarine count sites is not a sufficient indicator of conservation value of the area. This study did not focus on the diversity of bird species in the count sites. It might change the conservation priority picture only to some extent.

Although the total number for both estuaries dropped steadily from an all-time high of 93 on the day of the lowest water level recorded, none **returned** to the other frequented areas (including the Riet River where Spoonbills were observed some time before the study started). For instance, on 6/4 there were 37 Spoonbills in Area 3 of the East Kleinemonde estuary. Some (apparently 6) seemed to have joined the 47 making the total 53 on 7/4 in study Area 2 of the West Kleinemonde estuary. On four days (7/4, 8/4, 11/4 and 12/4) the birds have crossed over to Areas 2 of both estuaries. This suggests that when water conditions changed and exposed ideal feeding niches, Spoonbills dispersed between niches. For ease of understanding I termed this movement as **intra-niche dispersal**. The period 6/4 to 13/4 represented such period.

There is an intricate relationship between optimum water levels for foraging in the Kleinemonde estuaries and Spoonbill numbers – as this study about an approximate **three kilometre radius** between the five areas (including the Riet River) suggested.

The number of birds that left the area most likely dispersed to more lucrative feeding waters **outside the three kilometre radius**.

The Spoonbills were attracted to ideal feeding niches **within less than 24 hours** when the water levels in the estuaries dropped, but took longer to leave when conditions changed. There might be three explanations for this: firstly, the birds do not know where else to go; secondly, they are waiting for conditions to improve again; thirdly, the birds are not yet hungry enough to have left for more productive niches.

There seems to be a 'way of finding out or knowing when or where to leave to' when conditions are favourable. The question is: how do Spoonbills know this? Do they frequently fly over known niche areas to 'scout' the conditions? For instance, from before the flood until about 12/4, did they fly from West Kleinemonde estuary Area 2 to East Kleinemonde estuary Areas 2 and 3 to **'scout' the conditions** and then returned because the latter were no better? How did they know conditions at East Kleinemonde estuary Area 3 were better from 12/4 for the rest of the month? Spoonbills visit the Riet River estuary. Why not during this period at all when conditions seemed to be ideal?

It is unclear if **smell** plays a role in determining 'new' or preferred feeding niches because when muddy areas become exposed, it has its own unique smell.

Tidal influence on the daily dispersal movements needs attention. This would require 12 hours observation provided the estuaries are open. The water level between 4/4 and 1/5 varied between -12 cm and +2 cm making the range only 23 cm.

The sensitive relationships between water level and ideal foraging niches; between water levels and quality of feeding niches; between ecologies and anthropogenic factors; between these combined and conservation philosophies and practices, highlight the need for sustained attention to **critical ecologies**. This raises the question if there are, in fact, any other than critical ecologies?

The hypotheses developed, the conclusion arrived at about fluctuating water levels African Spoonbill movements, and the methodology applied, need to be tested against the existing literature and **further empirical study**.

Table 1. Number of Spoonbills counted daily at five locations between 3/4/ and 1/5/2015

[illegible]

Fig 2. Daily water levels and Spoonbill numbers

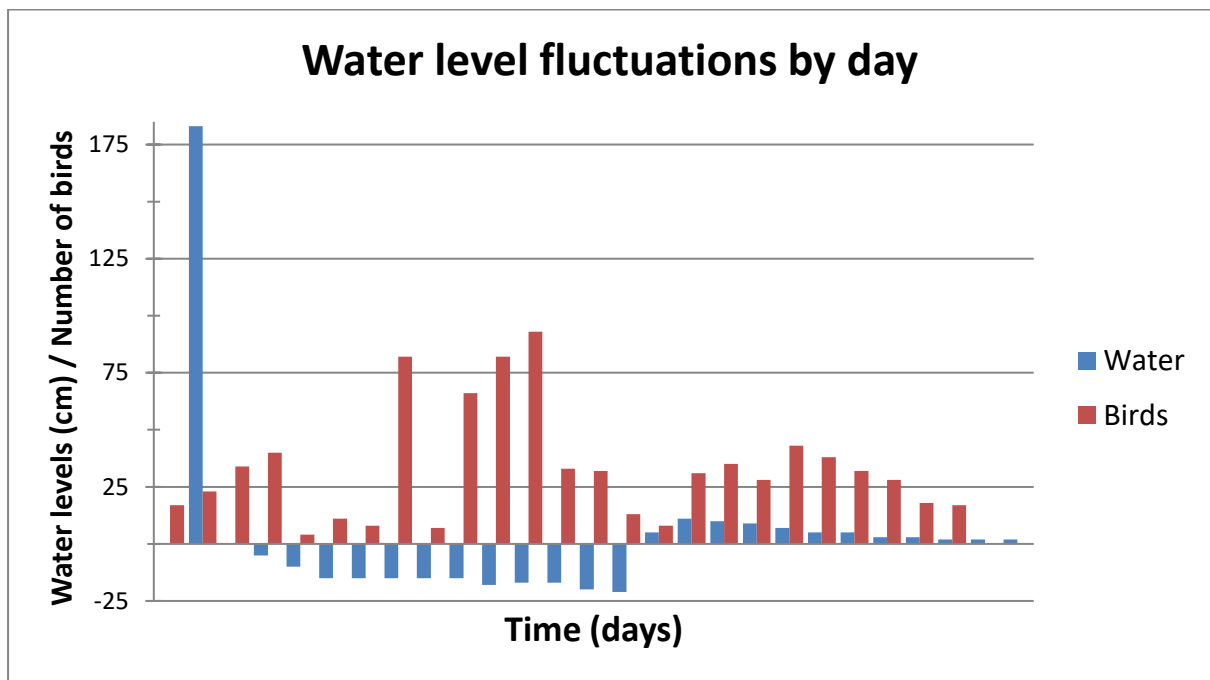


Photo 1. The East Kleinemonde estuary 2 days after opening



Photo 2. African Spoonbills arrived but before new 'islands' appeared



Photo 3. New 'islands' start to appear



Photo 4. 28 African Spoonbills on 7/5/2015 at the East Kleinemonde estuary Area 3



Photo 5. A new 'island' abandoned



Photo 6. East Kleinemonde estuary closed